CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER No. 94-131

WASTE DISCHARGE REQUIREMENTS, and
NPDES PERMIT NO. CA003007 FOR:

PORT OF OAKLAND
GALBRAITH DREDGED SEDIMENT DISPOSAL SITE
TEMPORARY CLASS II SURFACE IMPOUNDMENT,
CAPPING OF SAN LEANDRO LANDFILL &
BENEFICIAL REUSE OF DREDGED SEDIMENT
OAKLAND, ALAMEDA COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region, (hereinafter called the Regional Board), finds that:

1. This Order is a consolidated permit containing Waste Discharge Requirements for a temporary Class II surface impoundment and a National Pollutant Discharge Elimination System (NPDES) Permit for discharge of dredged sediment decant water to San Francisco Bay.

2. The Port of Oakland (hereinafter called the discharger) has submitted a Report of Waste Discharge (HLA, 1994B), dated June 10, 1994, for the upland disposal of approximately 1.2 million cubic yards of dredged sediment in temporary Class II impoundments to be constructed at the Galbraith Golf Course (Figures 1 and 2). This dredging project is being conducted by the discharger and the U.S. Army Corps of Engineers to deepen the Oakland Outer and Inner Harbor to elevation -42 feet mean lower low water. In addition, dredging will be conducted to create a new turning basin in the Inner Harbor and to deepen vessel berths.

3. The discharger submitted an application for an NPDES permit dated June 13, 1994 for discharge of decant water from dredged sediments at the proposed Galbraith site.

4. The July 1994 Supplemental Environmental Impact Report/Environmental Impact Statement, Oakland Harbor Deep Draft Navigation Improvements describes this dredging project in detail. Approximately 6.6 million cubic yards of sediment will be dredged to accommodate deep-draft ships and improve handling capability. Of the total 6.6 million cubic yards, 2.9 mcy will be discharged at the unconfined open-water disposal site near the Farallon Islands and 2.5 mcy will be discharged at the Sonoma Baylands wetlands restoration project, in southern Sonoma County. Dredged sediment discharged to the Sonoma Baylands site will be used to create wetlands as regulated under Board Order No. 93-081.

5. The Galbraith site is located immediately south of the Oakland Airport in the City of Oakland. The site is bounded to the northeast by Doolittle Drive and commercial and industrial buildings; to the south by the San Leandro wastewater treatment plant and industrial buildings, to the southwest by a saltmarsh, and to the northwest by Airport Drive and the Oakland International Airport. A drainage channel traverses the site from Doolittle Drive to the southern boundary. The nearest residential neighborhood is located one-half mile east of the site (Figures 1 and 2).

6. The existing Galbraith Golf Course is owned by the discharger and is underlain by the former San Leandro Landfill. The dredged sediments to be placed at the Galbraith Site contain considerable fine-grained materials and, thus, will provide a thick relatively impermeable layer or cap over most of the landfill.

WASTES AND THEIR CLASSIFICATION

7. Within Chapter 15, waste is classified by comparing levels of soluble pollutants to applicable water quality objectives. Contaminants in the dredged sediment could potentially impact surfacewater and groundwater quality. Thus applicable water quality objectives are the more stringent of drinking water MCLs and Basin Plan effluent limits.

8. The discharger proposes to discharge high moisture content dredged sediment (approximately 20-40 % solids) classified under Chapter 15 as liquid designated waste to a temporary Class II impoundment. The following chemical constituents are elevated in the dredged sediment when compared to ambient concentrations in San Francisco Estuary sediments: cadmium, chromium, copper, lead, mercury, nickel, total petroleum hydrocarbons, polychlorinated biphenyls, polynuclear aromatic hydrocarbons, and butyltins. None of the constituents have been detected at hazardous waste concentrations. A summary of the results and comparison to ambient San Francisco Estuary sediment levels and hazardous waste levels is shown on Table 1 below. Sediment contamination is the result of maritime and other industrial activities, spills, and nonpoint source pollution from onsite and offsite sources. The highest levels of sediment contamination is found in the proposed turning basin wings adjacent to Schnitzer Steel Products and Todd ShipYard. The lowest levels of sediment contamination is found in Outer Harbor sediments, while intermediate levels are detected in the Inner Harbor sediments.

Table 1. Comparison of the Concentration of Metals and Organic Compounds in Galbraith Dredged Sediment to Ambient San Francisco Estuary Sediment

(All units mg/kg)

Chemical Constituents	San Francisco Estuary Range[1]	San Francisco Estuary - Average[1]	Galbraith Sediment Range[2]	Galbraith Sediment Arithmetic Mean[2]	Hazardous Level - Title 22 (TTLC)[3]
Arsenic	4.2-29.4	11.3	1.86-28.9	8.93	500
Cadmium	0.12-0.74	0.25	.02-8.04	0.83	100
Chromium[4]	61-87	76	32-2150	348.7	2500
Copper	22-124	45	9.1-462	81.7	2500
Lead	8-110	39	5.3-497	58.9	1000
Mercury	0.031-0.472	*	0.003-15.1	0.87	20
Nickel	62-90	76	29.3-390	94.3	2000
Zinc	77-137	112	25.3-549	115.4	5000
Oil & Grease	NA	NA	3.15-2004	266.61	NI
TPH	13.2-63.4	NA	1.04-2082	193.26	NI
PCBs	.006-.14	0.045	0.19-3.8	0.27	50
PAHs	0.16-3.27	NA	5.27-29.13	15.3	NI
Tributyltin	NA	NA	0.6-2600	184.6	NI

All sediment units are mg/kg, dry weight except the TTLC's, which are wet weight
[1]San Francisco Estuary Ambient Data: As, Hg, Oil and Grease, TPH and PAH data from Aquatic Habitat Institute Draft 1993 San Francisco Estuary Regional Monitoring Program for Trace Substances; Cd, Cr, Cu, Pb, Ni, and Zn data from San Francisco Bay Pilot Regional Monitoring Program (RWQCB, 1992), PCB data from Long et al. (1988).
[2]From HLA (1994B)
[3] Total Threshold Limit Concentration
[4] total chromium
* - no average
NI - none included
TPH - Total Petroleum Hydrocarbons
PCB - polychlorinated biphenyls
PAH - polynuclear aromatic hydrocarbons
NA- None available

9. This Order requires confirmation sampling after the dredged sediment has dried. Any dredged sediment discharged to the Galbraith site, that exceeds the waste acceptance criteria, must be excavated and disposed of at an appropriate landfill.

10. **Waste Acceptance Limits** - Attenuation factors proposed by the discharger are 300 for inorganic chemicals and 150 for organic chemicals. Waste acceptance limits are calculated as follows:

Acceptance limit = (Water Quality Objective X Attenuation Factor)/Test Method Dilution Factor

The waste acceptance limits for the Galbraith site are highly dependent on the pH used in solubility tests. The level of soluble pollutants is normally determined by performing a leach test to determine whether sufficient amounts of extractable constituents are available to leach to groundwater under acidic landfill conditions. Two leachate tests are generally run to characterize a waste. The Waste Extraction Test (pH of 5) for inorganics and the Toxic Characteristic Leaching Procedure (pH of 2.9-4.9 depending on sample pH) for inorganics. In upland environments the pH of dredged sediment may drop as sulfides in the sediment are oxidized and acid is created. However, the discharger has argued that a significant pH drop has not been shown based on previous Port of Oakland upland disposal projects. In addition, the discharger proposes to monitor soil pH for low pH conditions and will add lime to any problem areas to neutralize acid soils.

Wastes disposed at Galbraith shall not exceed the concentrations shown on Attachment A to this Order based on a modified waste extraction test using deionized water.

11. **Post Disposal Confirmation Sampling** - Task 7 of this Order requires that samples be collected after the dredged sediments have dried to confirm compliance with the waste acceptance criteria in Attachment A.

12. The Port has completed an analysis of the sediments to be discharged at the Galbraith Site. The analytical results from these tests, in conjunction with a health and environmental risk analysis performed by the Port (HLA, 1994A), indicate that the material is suitable for the proposed upland disposal alternatives.

DESCRIPTION OF SITE

13. **Historical wetland filling** - Prior to filling, the site consisted of shallow tidal mud flats, marshes, and low lying areas adjacent to San Francisco Bay. Between the 1930s and 1960s the site was progressively filled with municipal solid waste, hydraulic fill, and construction/demolition debris, with lesser amounts of sludge from the San Leandro Sewage Treatment Plant. Hydraulic fill occurs

primarily along the Airport drive portion of the site and is outside of the impoundment area. The thickness of the municipal solid waste and construction debris varies from 0 to 20 feet with an average of about 15 feet.

14. **Precipitation** - Average annual precipitation is 17.77 inches. The 100 year, 24 hour storm event is 4.49 inches.

15. **Geology** - Three main geologic units have been described at the site: artificial fill, Young Bay Mud, Older Bay Mud and alluvium. A summary of these units is shown on Table 2. Figure 3 is a regional geologic cross section through the Galbraith site.

Table 2. Generalized Stratigraphy, Galbraith Golf Course Site

General Unit	Sub Units	Description	Depth below ground surface (ft)
Artificial Fill	Vegetative Cover	sandy silt and clay to silty sand with gravels	0-10.5 (cover is generally approx. 2 feet thick)
	Refuse	5-50% refuse in a soil matrix (glass, wood, rags, paper, rubber etc.)	0-12.5
	Construction Debris	10-50% wood brick and concrete in a soil matrix	0-20 present in western portion of site
	Hydraulically Placed Fill	dredged material similar to bay mud deposits; one sample is sand.	4.5-9.5
Younger Bay Mud		soft dark gray clay	10-21.5 (unit is approx. 5 ft thick)
Older Bay Mud and alluvium		sandy clay to sand	2-35 (layer >20 ft thick)

16. **Surface Water** - Historically, the site was a marshland and tidal flat subject to flooding, as freshwater drainage mixed with saline tidal flow. As fill was placed, freshwater was channeled and a tidal gate was installed, creating a separation between the freshwater and tidal flow water. As a result most runoff at the site (except the extreme northern and western portions of the site) either drains vertically into the landfill cover material or laterally to the drainage channel.

The drainage channel discharges to an embayment between East Bay Regional Park District's Oyster Bay Park (formerly Davis Street Landfill) and the Oakland International Airport and then into San Francisco Bay.

Surface water data collected immediately upstream and downstream from the site indicated that downstream waters had lower concentrations of chloride and organic chemicals than the upstream station. The source of the offsite/upgradient organic chemicals (e.g., total petroleum hydrocarbons, trichloroethene, cis-1,2 dichlorenthene, trichloroethane, chloroform, chloroethane, Freon 113) is under investigation by Board staff.

17. **Wetland** - A saltmarsh, approximately 75 acres in size, is located immediately south/southwest of the site and is one of only a few large year-round pickle weed marshes located in this part of the Central San Francisco Bay and is an important habitat for blacknecked stilts and other salt marsh species.

18. **Groundwater** - The Galbraith site is located in the San Leandro Cone Subarea of the East Bay Plain Groundwater Basin. Groundwater occurs beneath the site at depths varying from 3.7 to 17.2 feet below the ground surface, which correspond to elevations of 0.5 to 14 feet (Port of Oakland datum). Groundwater is generally not tidally influenced.

Water levels in the nine onsite wells do not indicate a consistent general trend in the groundwater flow direction at the site. This trend is believed due to the combined effects of the variation in the well screen elevations, recharge from the drainage channel, and influences of perched and confined aquifer conditions. However, the approximate regional flow is southwest towards the salt marsh and San Francisco Bay.

All existing groundwater monitoring wells are located within the footprint of the proposed surface impoundment and thus will need to be destroyed. For purposes of longterm monitoring, 7 new groundwater monitoring wells will be installed around the perimeter of the site. Five of the 7 wells will be located along the south west portion of the site, consistent with the regional westward groundwater flow direction toward San Francisco Bay.

19. **Well Survey** - A well survey was performed for wells within approximately one-half mile of the site to obtain information pertaining to groundwater use and quality in the area. The survey identified 78 wells of which 63 are monitoring wells, 9 are stock/domestic/industrial wells, 4 are cathode protection wells, 2 are irrigation wells, and 2 are of unknown use. According to Alameda County Flood Control and Water District, wells listed as "domestic" within this portion of the basin are generally small landscape irrigation wells. Based on the well survey, none of the wells identified are likely to be negatively affected by this project. The closest municipal drinking water supply wells are the City of Hayward's emergency supply wells located 6 miles to the southeast. Most groundwater for municipal purposes is pumped from the Alameda Formation (see Figure 3).

20. **Groundwater Contamination** - The discharger has conducted a groundwater quality investigation at the site. Fifteen groundwater monitoring wells have been installed and sampled to characterize the site. Four wells have been installed in leachate within the refuse fill and eleven wells have been installed in the underlying native sediments. In general, the leachate in the refuse fill contains higher levels of contamination than groundwater in the underlying native sediments. The most frequently detected contaminants are gasoline, diesel, motor oil, and chlorinated solvents. Likely sources of groundwater contamination include the landfill waste, an automobile wrecking yard that once occupied a portion of the site, and offsite sources. A regional study of a number of groundwater contamination sites located in San Leandro, southeast of Galbraith, was prepared for the Department of Toxic Substances Control (Woodward-Clyde, 1993).

The groundwater beneath the Galbraith site may be further contaminated by leachate from the dredged sediment due to infiltration of leachate through the unlined base of the impoundment. Contamination of the shallow groundwater in the form of higher levels of chloride and metals is likely within the limits of the perimeter of the cutoff wall. However, contamination of groundwater beyond the perimeter of the impoundment beneath the site will be mitigated by the cutoff wall and groundwater extraction if needed.

Shallow groundwater beneath the eastern third of the Galbraith Site qualifies as a source of drinking water pursuant to State Board Resolution No. 88-63. However, it is unlikely to be used as a source of drinking water for the following reasons: (1) wells screened in the fresher water are also contaminated with solvents and fuel constituents from onsite and offsite sources, (2) the area is vulnerable to sea water intrusion, (3) the area is already served drinking water by the East Bay Municipal Utility District. Groundwater is currently used for industrial and agricultural purposes in the vicinity of the site.

PROJECT DESIGN

21. The discharger proposes to construct two, fifty-acre dredged sediment drying impoundments over the former Galbraith Landfill. A system of perimeter earthen dikes approximately 10,000 feet long will be constructed to contain the slurried dredged sediment. Centerline beneath the perimeter dikes will be a soil bentonite cutoff wall which will serve to contain water that will infiltrate from the slurried dredged sediments, as well as to contain liquid currently in the existing landfill. A summary of the project design follows:

A. Perimeter dikes - The proposed development at the site consists primarily of construction of perimeter dikes to contain the dredged sediment. To contain the proposed volume of dredged sediment, the dikes will be constructed to a maximum crest elevation of 28 feet MLLW. The dikes will have inboard and outboard slopes of 2:1 (horizontal to vertical) with the exception of the Stage 1

outboard slope along the saltmarsh segment which will be 3:1 for increased stability.

The dikes will be constructed in two stages. During the first stage, the dikes will be extended to elevation 22 feet MLLW. The dikes shall remain at this elevation for a minimum of 12 months to allow landfill and bay deposits to consolidate and gain strength prior to increasing the dike height. During the second stage, the dikes will be raised to elevation 28 feet MLLW. The vertical and lateral displacement of the dikes will be measured to monitor the safety of the dikes and confirm design assumptions (See Self-Monitoring Program, Table 1B).

The preliminary estimates indicate that the quantity of soil needed to construct the dikes is between 300,000 and 400,000 cubic yards. The perimeter dike will be constructed with a 18-inch thick low permeability ($\leq 1 \times 10^{-6}$ cm/sec) layer that extends from the top of the dike down its interior slope to the toe, and continues as a 2-foot thick barrier layer under the dike cutoff wall.

B. Perimeter Cutoff Wall - The perimeter cutoff wall will be centered under the perimeter dikes and will extend around the full perimeter of the dredged sediment ponds. The cutoff wall will be a minimum of 2 feet in width and extend a minimum of 4 feet into the underlying bay mud or other competent low permeability clay or silt layer. The cutoff wall will have a field permeability of $\leq 1 \times 10^{-7}$ cm/sec.

C. Pond and Effluent Control - Two dredged sediment ponds will be formed by the dike system. The ponds will be alternately filled with dredged sediments that will be allowed to settle and consolidate. Decant water removed from the ponds will be directed through a filter medium and a weir and into a vegetative control area located between the two ponds. The decant water will pass slowly through the vegetative control area to allow for additional metals reduction by the settling of fines with which trace metals are associated, and by plant uptake of metals. Water discharged to San Francisco Bay must meet discharge effluent limits listed in Table 3.

D. Sediment Drying - After placement of the dredged sediments and removal of the initial decant water, drying of the sediment will be facilitated by use of ditches dug through the dredged sediments following standard sediment drying techniques. When the dredged sediments have dried sufficiently, a perimeter ditch will be formed on the inboard side of the outermost dikes. The ditch will be extended to the current groundsurface to allow upward migration of groundwater if the underlying fill becomes saturated. Task 2 requires a contingency plan for isolating and treating any floating petroleum hydrocarbons which may locally migrate into the perimeter ditch.

E. Dike Stability Analyses - The geotechnical conditions at the site were characterized based primarily on a field exploration program consisting of 35 borings drilled to depths as great as about 40 feet and 28 shallow test pits and a laboratory testing program to analyze samples obtained from the borings and obtain site specific data. The dikes will be monitored during construction, filling and post-construction phases.

The dike design was evaluated for various static and expected earthquake ground shaking conditions (Subsurface Consultants Inc., 1994). A summary of the results are as follows:

a. Static Stability - The static factors of safety for the dikes range from 1.2 to 2.2. The lower factors of safety represent the short-term conditions immediately following completion of the Stage 2 section of the dikes. The long term stability factors of safety are in the range of 1.5-2.2. The Board finds that the lower factors of safety immediately following completion of the Stage 2 section of the dikes justifies a requirement that filling of the Stage 2 dikes be postponed until the discharger demonstrates that a factor of safety of 1.3 has been achieved.

b. Settlement - The landfill debris and soft bay mud will experience settlement under the weight of the proposed dike fills. Most of the settlement will occur simultaneously with placement of the dike fill materials. However, longterm settlements of up to approximately 4 feet are predicted for the dikes. The geotechnical monitoring program contained in the Self-Monitoring Program requires daily visual inspection and weekly surveys of the perimeter dike system during filling.

c. Seismic Stability - The closest active fault is the Hayward Fault located 3.2 miles east of the site. The maximum credible earthquake was determined to be a Richter Magnitude 8 earthquake on the Hayward Fault, capable of producing an estimated maximum groundsurface acceleration of 0.5 g. The pseudostatic (earthquake) stability analysis indicates that the dikes will not experience significant permanent deformation in the event of small to moderate earthquakes. However, a large earthquake on the Hayward Fault may cause some permanent lateral deformation of the dikes or the cutoff trench. Lateral movements on the order of up to 3 feet could be expected within the dikes. Lateral displacement sufficient to cause dike breach and loss of dredged material containment is possible but considered unlikely.

Studies were conducted to determine where the most probable location of dike damage could occur. This study examined the various cross-sections of the dikes surrounding each of the ponds. It was concluded that the dikes with the lowest factors of safety are those adjacent to Airport Drive and the drainage channel that bisects the site. These locations are therefore considered to be the locations where dike damage is the most likely to occur in the event of a large earthquake. The dike adjacent to Airport Drive is set back approximately 100

feet from the edge of the roadway. In the event of dike damage in this location, the flood path would be along the drainage swale adjacent to Airport Drive in a southerly direction to the saltmarsh, located south of the site, which drains to San Francisco Bay. The dike adjacent to the drainage channel that bisects the site is similarly set back from the top of bank of the channel. The potential flood path, in this case, would be into the drainage channel which also drains to San Francisco Bay.

Potential impacts due to the loss of containment require both a breach of the perimeter dike and the dredged sediment being in a fluid state in which it can flow out of the containment area. The dredged material will only be in a fluid state capable of gravity flow for about one year following placement. Given the frequency of large magnitude earthquakes, the low risk of dike failure and the short period of time that fluid dredged sediment will exist in the facility, the risk of loss of containment is believed to be very low. The discharger has agreed to modify the design and operation of the impoundments to improve safety by reducing the storage volume to $\leq$ 50 acre feet. Because of the lower storage volume, the impoundments will be exempt from Department of Water Resources - Division of Dam Safety requirements.

d. Liquefaction - The liquefaction analysis indicates the potential for liquefaction of saturated soils underlying portions of the site. A lateral deformation of the dikes of up to 7 feet is predicted for a maximum credible earthquake of 8.0 on the San Andreas Fault. However, deformation of this order of magnitude is not expected to result in a dike breach, hence, losses of dredged sediment containment is also unlikely.

22. **Independent technical review** - The discharger commissioned an independent (third-party) technical review of the above geotechnical dike stability analyses (Geomatrix Consultants Inc., 1994). The independent technical review found that the stability and performance evaluation results (i.e., factors of safety and slope deformation) presented in the dike stability analyses are reasonable and follow engineering state-of-practice.

23. The Board finds that the potential for dike failure has been reduced by design features which include sealing of the inboard face of the dike to reduce infiltration and saturation; decrease in the outboard slope angle from 2:1 to 3:1 along the saltmarsh segment to increase stability; and construction of the dikes in two stages to allow for consolidation and increased strength. Thus given the very low risk of loss of containment and the critical need for upland disposal sites, disposal of the dredged sediment at Galbraith is justified.

24. **Engineered Alternatives** - The proposed surface impoundment design satisfactorily meets Chapter 15 requirements for the dike design, seismic design, and drainage control facilities. Pursuant to Section 2510 of Chapter 15, the discharger has proposed engineered alternatives to the following prescriptive

requirements of Chapter 15:

A. Cutoff wall - The discharger has proposed that the cutoff wall be keyed a minimum of two feet into natural geologic material (Bay Mud) rather than the five feet as specified in Section 2545 of Chapter 15. The Board disapproves this engineered alternative. However, based on Board staffs experience with other similar cutoff walls and the engineering analysis submitted by the Port of Oakland we believe a reduction in the keyway depth from 5 feet to 4 feet is acceptable.

B. Liner System - Typically, a composite liner system (geomembrane over clay) is required for surface impoundments. The discharger has proposed that a liner system is not necessary because protection of water quality will be achieved by construction of a perimeter cutoff wall. Other factors which support this alternative are the high cost of importing approximately 340,000 cubic yards of soil-liner material and the likelihood that the liner system would be damaged during filling due to differential settlement of the underlying waste. The Board approves this engineered alternative.

C. Leachate Collection and Removal System - A leachate collection and removal system would be required to minimize the hydraulic head on the liner, if a liner were installed. The discharger has proposed that a liner system is not necessary because protection of water quality will be achieved by construction of a perimeter cutoff wall. The discharger has agreed to install piezometer pairs to monitor the effectiveness of the cutoff wall and will implement a contingency plan (See Task 2) to protect water quality if needed. The Board approves this engineered alternative.

D. Depth to Groundwater - Section 2530(c) requires a minimum separation of 5 feet between waste and highest anticipated groundwater. Depth to groundwater varies from 3.7 to 17.2 feet below ground surface at the site, thus the 5-foot separation requirement is not met. However, the shallower groundwater occurs in perched zones within the refuse fill and wells screened in the Bay Mud and Older Bay Deposits indicate that groundwater is confined and rises five to ten feet above the screened interval. Groundwater migration will also be controlled by the perimeter cutoff wall. The Board approves this engineered alternative.

25. **Dredged Sediment Transportation** - The sediment will be removed from the Oakland Harbor using clamshell and suction dredges and placed in a scow that will ferry the material either from San Leandro Bay via the Airport Channel (Option A) or from a location in San Francisco Bay, southwest of Galbraith (Option B). See Figure 5. There would be a large pump at the off-loading station, with additional pumps along the pipeline route to Galbraith. Option A would require a 17,000 ft. pipeline and a 4.5 nautical mile haul. Option B would require either a 27,000 ft. pipeline and a 10.2 n. mi. haul or a 29,000 ft. pipeline and a 7.8 n.mi. haul. Task 3 of this Order requires submittal of an operation

and maintenance plan for the safe transportation and discharge of the slurried dredged sediments.

26. **Wetlands Mitigation Plan** - Construction of the surface impoundments will result in the loss of 2.86 acres of wetlands due to filling. Wetlands that will be filled are composed of a main drainage channel with a tributary water course, brackish marsh habitat, seasonal wetlands, and one ponding area. The discharger has submitted a mitigation plan (LSA, 1994) that proposes to create 4.06 acres of seasonal salt and brackish marsh, as well as permanent marsh with ponding areas. Provision 9 of the Order requires submittal of a report documenting As-built conditions of the mitigation project as well as annual mitigation monitoring reports.

27. The clearing of the site for construction of the surface impoundments will result in the loss of hundreds of trees. The Board understands that no mitigation for the loss of trees is required by any agency. However, the Board encourages the discharger to voluntarily undertake a tree planting program in compensation for this loss.

28. **California Environmental Quality Act** - The Port of Oakland and U.S. Army Corps of Engineers jointly prepared a Final Supplemental Environmental Impact Report/Statement - Oakland Harbor Deep Draft Navigation Improvements dated June 1994. On September 13, 1994, the U.S. Army Corps of Engineers signed a Record of Decision certifying the environmental impact statement. Also on September 13, 1994, the Board of Port Commissioners adopted Resolution No. 94356 certifying the environmental impact report for the project.

The project, as described in the EIR/S, will have the following potentially significant Impacts:

Potentially Significant Impact	Management Mitigation Measure	Section of this Order that will mitigate or avoid adverse environmental impacts of the project on water quality
At the Galbraith Golf Course site, significant impacts on groundwater quality due to the lateral migration of existing leachate fluids containing petroleum products.	Design containment structures to meet RWQCB requirements.	Provision 2
At the Galbraith site, data show that discharge to surfacewater may exceed water quality objectives. Additionally, data may not adequately predict potential water quality impacts.	Vegetative control areas will be placed outside of the drying ponds to increase sedimentation and provide natural treatment for metals. Effluent monitoring will show whether Regional Board standards are being met. If standards are not met, decant water can be held in the ponds for an extended period.	Effluent Limitations (Table 2) and Self-Monitoring Program
Placement on the Galbraith site of sediment containing elevated levels of contamination exceeding levels acceptable to the Regional Board.	The discharger will conduct additional sampling after the dredged sediment dries to confirm that there are no "hot spots" present	Provision 8, Task 7
If a large magnitude earthquake occurred on a nearby fault, earth quake-induced levee failure at the Galbraith Site could cause geologic hazards on surrounding features such as Doolittle Dr., the interior drainage canal, and the San Leandro Wastewater Treatment Plant.	Design levees using standard geotechnical engineering practices to prevent catastrophic impacts on adjacent facilities in the event of failure.	Provision 2, Task 1 and Provision 5, Task 4
Disturbance of aquatic biota by pipeline construction and pumping operations; potential impacts from fuel spills or a break in slurry pipeline.	Set anchors for the duration of the project;careful handling of fuel;install leak detection system on the pipe and/or monitor slurry discharge.	Provision 4, Task 3

29. The Board, as a participant in the Long-Term Management Strategy, is examining alternative management options for disposal of dredged sediment over a 20-50 year planning horizon. The Board finds that it is in the public interest to allow the use of the Galbraith Site for the disposal of dredged sediment for this project, so long as this is done in a manner to minimize impacts on water quality and the loss of wetland habitat values.

30. The Board adopted a revised Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) on December 17, 1986. The Board amended its Basin Plan on September 16, 1992, and the State Board approved it on April 27, 1993, with approval from the State Office of Administrative Law pending. Section 1 of the 1992 Basin Plan amendments, "Implementation of Statewide Plans," was remanded by the State Board on June 23, 1994, due to its reliance on the two Statewide Plans that are no longer legally in effect. The Basin Plan identifies beneficial uses and water quality objectives for surface and ground waters in the region, as well as discharge prohibitions intended to protect beneficial uses.

31. Effluent limitations in this permit are based on the plans, policies, and water quality objectives and criteria of the Basin Plan, *Quality Criteria for Water* (EPA 440/5-86-001, 1986; Gold Book), Applicable Federal Regulations (40 CFR Parts 122 and 131), the National Toxics Rule (57 FR 60848, 22 December 1992; NTR), and Best Professional Judgment.

32. The existing and potential beneficial uses of groundwater in the vicinity of the site include municipal and domestic water supply, industrial process water supply, industrial service water supply, agricultural water supply. The beneficial uses of Central San Francisco Bay waters are as follows:

    a. Navigation
    b. Water contact recreation
    c. Non-water contact water recreation
    d. Industrial process supply
    e. Industrial service supply
    f. Wildlife habitat
    g. Fish spawning
    h. Ocean commercial and sport fishing
    i. Preservation of rare and endangered species
    j. Fish migration
    k. Shellfish harvesting
    l. Estuarine habitat

33. The Board has notified the discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for the discharge, and has provided them with an opportunity to submit their written views and recommendations.

34. The Board in a public meeting heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED that the discharger shall meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder and shall also comply with the following:

A. EFFLUENT LIMITATIONS

The effluent, at the discharge point from the vegetative control area, shall not contain constituents in excess of the limits contained below:

Table 3. Effluent limits

Constituent	Instantaneous Maximum Limit (ppb)	Basis for Limitation
Arsenic	20	Basin Plan
Cadmium	10	Basin Plan
Chromium (VI)[1]	11	Basin Plan
Copper	20	Basin Plan
Cyanide	25	Basin Plan
Lead	5.6	Basin Plan
Mercury	1	Basin Plan
Nickel	7.1	Basin Plan
Silver	2.3	Basin Plan
Zinc	58	Basin Plan
Dissolved Sulfide	100	Best professional judgement
Phenols	500	Basin Plan
PAHs	15	Basin Plan
TPH	50	Best professional judgement
Total Suspended Sediment	100 ppm	Best professional judgement
pH	6.5-8.5	Basin Plan
Toxicity to fish	90% median survival and 90 percentile value of 70% min.	Basin Plan

[1] The discharger may, at there option, meet this limit as total chromium
Basin Plan- 1986 Basin Plan Table IV-1
TPH - total petroleum hydrocarbons (as identified by EPA Method 8015)
PAH - polynuclear aromatic hydrocarbons (as identified by EPA Method 610 or 625)
ppb - parts per billion
ppm - parts per million

2. The discharge shall not exceed 7 million gallons per day.

B. RECEIVING WATER LIMITATIONS

1. The treatment and/or disposal of waste shall not create a nuisance as defined in Section 13050(m) of the California Water Code.

2. The disposal of waste shall not cause:

   a. Floating, suspended, or deposited macroscopic particulate matter or foam in waters of the State .

   b. Bottom deposits or aquatic growth in waters of the State at any place.

   c. Visible floating, suspended, or deposited oil or other products of petroleum origin in waters of the State at any place.

   d. Waters of the State to exceed the following quality limits at any point:

      Dissolved Oxygen - 5.0 mg/l minimum.

      When natural factors cause lesser concentrations then this discharge shall not cause further reduction in the concentration of dissolved oxygen.

      Dissolved sulfide - 0.1 mg/l maximum
      pH - A variation from natural ambient pH by more than 0.2 pH units.

      Toxic or other deleterious substances to be present in concentrations or quantities which may cause deleterious effects on aquatic biota, wildlife or waterfowl, or which render any of these unfit for human consumption either at levels created in the receiving waters or as a result of biological concentration.

3. The turbidity of the waters of the State, as measured in NTUs, shall not increase above background levels by more than the following:

Receiving Water Background	Incremental Increase
<50 units	5 units, maximum
50-100 units	10 units, maximum
>100 units	10% of background, maximum

C. PROVISIONS

1. The discharger shall comply with all Prohibitions, Specifications, and Provisions of this Order, immediately upon adoption of this Order or as provided below.

2. **Task 1**: The discharger shall submit **Construction Drawings and Specifications** acceptable to the Executive Officer pursuant to requirements of this Order. The report should include (1) a Construction Quality Assurance Plan for all aspects of construction, (2) an engineering evaluation of the capacity of the impoundments, including a demonstration that given the disposal volume, free board limitations, and conservative consolidation estimates, sufficient capacity exists for the 1.2 mcy of dredged sediment, (3) documentation that the bentonite slurry is compatible with expected salinity levels, (4) details regarding operation of the sediment control system such that sufficient settling will occur. The Construction Drawings and Specifications must be approved by the Executive Officer prior to construction.

   REPORT DUE DATE: 60 days prior to the installation of the cutoff wall.

3. **Task 2**: The discharger shall submit a **Contingency Plan** acceptable to the Executive Officer to be instituted in the event of a unacceptable settlement, leakage or a spill from the surface impoundment. The discharger shall give immediate notification to the San Francisco Bay Regional Water Quality Control Board, and the City of Oakland Fire and Police Departments. The discharger shall initiate its Contingency Plan to stop and contain the migration of liquids from beyond the perimeter dike system. The Contingency Plan shall also address the potential need for isolating and treating any floating petroleum hydrocarbons which may locally migrate into the perimeter ditches. The potential need for groundwater extraction shall also be addressed. The Contingency Plan shall also contain provisions for monitoring and controlling dust and odor releases beyond the discharger's property line.

   REPORT DUE DATE: 60 days prior to the discharge of dredged material.

4. **Task 3**: The discharger shall submit **Operation and Maintenance Plans** for (a) operation of the weirs and vegetative control and discharge of decant water and (b) the safe transportation and discharge of the slurried dredged sediments that includes addressing special requirements for surface impoundments listed in Section 2548 of Chapter 15.

   REPORT DUE DATE: 60 days prior to the discharge of dredged material.

5. **Task 4**: The discharger shall submit a detailed **Post Earthquake Inspection and Corrective Action Plan** acceptable to the Executive Officer to be implemented in the event of any earthquake generating ground shaking of Richter Magnitude 6.5 or greater at or within 60 miles of the landfill. The plan shall provide for reporting results of the post earthquake inspection to the Board within 72 hours of the occurrence of the earthquake. Immediately after an earthquake event causing damage to the perimeter dikes, the corrective action plan shall be implemented and this Board shall be notified of any damage.

   REPORT DUE DATE: 60 days prior to the discharge of dredged material.

6. **Task 5**: The discharger shall submit a **Closure Plan** acceptable to the Executive Officer that includes a schedule and plan for final grading and drainage of the site as well. The plan must include provisions for doing the necessary studies sufficient to develop an adequate closure plan for the portion of the former landfill that lies outside of the perimeter cutoff wall (See Figure 6). The closure plan shall also include an irrevocable closure fund pursuant to Section 2580(f) of Chapter 15.

   REPORT DUE DATE: 60 days prior to the discharge of dredged material

7. **Task 6**: The discharger shall submit a **Post Construction Certification Report** acceptable to the Executive Officer. The report shall include the actual laboratory results of the construction quality assurance program as well as a narrative discussion of whether the CQA results met the design specifications. The report should include certification by the CQA Professional Engineer and Licensed Surveyor that the surface impoundment was built as designed.

   REPORT DUE DATE: 30 days prior to the discharge of dredged material.

8. **Task 7A**: The discharger shall submit a **Post Disposal Confirmation Sampling Workplan** acceptable to the Executive Officer. The workplan shall include the proposed layout for samples to be collected in a grid 200-foot on-center and from samples collected from at least three representative intervals below ground surface at each sampling point defined by the grid. The sampling program shall be conducted to assess compliance with the waste acceptance criteria shown on Attachment 1 of this Order and to demonstrate that the sediments are nonhazardous. Samples should not be composite. A minimum of 20% of the samples shall be analyzed by the waste extraction test and for bulk chemistry for chromium, lead, mercury and zinc (pursuant to Title 22, Section 66699). Based on the results from the dredged sediment

influent (DS-1), the Executive Officer may increase or decrease the frequency of sampling. The workplan shall provide for further sampling to assess the vertical and lateral extent of any unacceptable sediments.

REPORT DUE DATE: 24 months after the last discharge of dredged sediment.

Task 7B: **Post Disposal Confirmation Sampling Results and Recommendations**. The report shall include the results of samples pursuant to the approved workplan submitted for Task 7A above. The sampling program is to be conducted to assess compliance with the waste acceptance criteria shown on Attachment 1 of this Order and to ensure that no hazardous material is discharged onsite. If any results indicate unacceptable levels of contaminants, further sampling will be conducted to assess the vertical and lateral extent of such wastes and an evaluation if the wastes are to be treated or removed.

REPORT DUE DATE: Four months after the point that the dredged sediment can support sampling equipment. Not to exceed 36 months after the last discharge of dredged sediment.

9. The discharger shall submit by 60 days prior to the discharge of dredged material, a Quality Assurance Project Plan (QAPP) covering the attached Self-Monitoring Program. The QAPP should follow Department of Water Resources Guidelines for Preparing Quality Assurance Project Plans (May, 1994).

10. The discharger shall submit a report documenting As-built conditions of the wetland mitigation project one year after wetlands completion and a mitigation monitoring report annually thereafter.

11. Filling of the Stage 2 dikes shall be postponed until the discharger submits a technical report acceptable to the Executive Officer that demonstrates that a minimum factor of safety of 1.3 has been achieved.

12. The discharge of dredged sediment, soil or other earthen materials from decanting, construction, or any other onshore operation in quantities sufficient to cause deleterious bottom deposits or turbidity or discoloration in excess of natural background levels in surface waters is prohibited.

13. A condition of this permit is that dust and odor from the dredged sediment disposal operations shall not cause a nuisance beyond the property boundary.

14. The discharger shall file with the Regional Board Self-Monitoring reports performed according to any Self-Monitoring Program issued by the Executive Officer.

15. The discharger shall notify the Board if any activity has occurred or will occur which would result in the discharge, on a frequent or routine basis, of any toxic pollutant which is not limited by this Order.

16. All reports pursuant to these Provisions shall be prepared under the supervision of a registered civil engineer.

17. The dredged sediment disposal site shall be designed, constructed and operated to prevent inundation, washout or erosion of wastes which could occur as a result of a 100 year 24 hour precipitation event or flood event.

18. The discharger shall ensure to the extent practicable that the foundation of the site, the levees surrounding the site, and the structures which control leachate, surface drainage, and erosion for this site are constructed and maintained to withstand conditions generated during the maximum credible earthquake.

19. The discharger shall install any and all leachate monitoring devices required to fulfill the terms of any Self-Monitoring Program issued to the discharger in order that the Board may evaluate compliance with the conditions of this Order.

20. Only dredged material that has been demonstrated to be nonhazardous and meets the waste acceptance criteria identified in Attachment A of this Order may be discharged to the Galbraith site. The discharge of any other waste is prohibited.

21. The discharger shall remove and relocate any wastes which are discharged at this site in violation of these requirements.

22. The discharger shall file with this Board a report of any material change or proposed change in the character, location, or quantity of this waste discharge. For the purpose of these requirements, this includes any proposed change in the boundaries of the disposal areas or the ownership of the site.

23. The discharger shall maintain a copy of this Order at the site so as to be available at all time to site operating personnel.

24. This Board considers the property owner and site operator to have continuing responsibility for correcting any problems which arise in the

future as a result of this waste discharge or related operations.

25. The discharger shall maintain all devices or designed features installed in accordance with this Order such that they continue to operate as intended without interruption except as a result of failures which could not have been reasonably foreseen or prevented by the discharger.

26. The discharger shall permit the Regional Board or its authorized representative, upon presentation of credentials:

    a. Entry upon the premises on which wastes are located or in which any required records are kept.

    b. Access to copy any records required to be kept under the terms and conditions of this Order.

    c. Inspection of any treatment equipment, monitoring equipment, or monitoring method required by this Order.

    d. Sampling of any discharge or groundwater covered by this Order.

27. These requirements do not authorize commission of any act causing injury to the property of another or of the public; do not convey any property rights; do not remove liability under federal, state or local laws; and do not authorize the discharge of wastes without appropriate permits from other agencies.

28. The portion of this Order that serves as a **National Pollutant Discharge Elimination System Permit expires on September 21, 1999**. The discharger must file a report of waste discharge in accordance with Title 23, Division 3, Chapter 9 of the California Code of Regulations no later than 180 days in advance of such expiration date as application for issuance of new waste discharge requirements.

29. This Order shall serve in part as National Pollutant Discharge Elimination System Permit pursuant to Section 402 of the Clean Water Act or amendments thereto, and shall become effective 10 days after date of its adoption provided the Regional Administrator, Environmental Protection Agency, has no objection. If the Regional Administrator objects to its issuance, the permit shall not become effective until such objection is withdrawn.

I, Steven R. Ritchie, Executive Officer, do hereby certify that the foregoing is a full, complete, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on September 21, 1994.

Steven R. Ritchie
Executive Officer

Attachments:

Figure 1. Location Map - Galbraith Dredged Sediment Disposal Site,.
Figure 2. Site Map - Galbraith Dredged Sediment Disposal Site.
Figure 3. Generalized Regional Geologic Cross Section.
Figure 4. Typical cut off wall and dike design.
Figure 5. Pump-out and pipeline options for disposal.
Figure 6. Site Map and Location of Former Landfills.
Attachment A: Waste Acceptance Criteria
Self-Monitoring Program

References Cited:

Geomatrix Consultants Inc., 1994, Independent technical review of Subsurface Consultants Inc, (1994) Geotechnical Investigation and Slope Stability Analysis, Letter report dated July 8, 1994.

Harding-Lawson Associates, 1994A, Human Health Risk Assessment, The Leonard Ranch Rehandling Site (Sonoma Co. CA) Galbraith Golf Course (Oakland, CA), and the Ninth Avenue Marine Terminal (Oakland, CA), report dated March 24, 1994.

Harding-Lawson Associates, 1994B, Report of Waste Discharge, Placement of Oakland Harbor Channel Deepening Dredged Sediments at Galbraith Golf Course, Oakland, CA, report dated June 10, 1994.

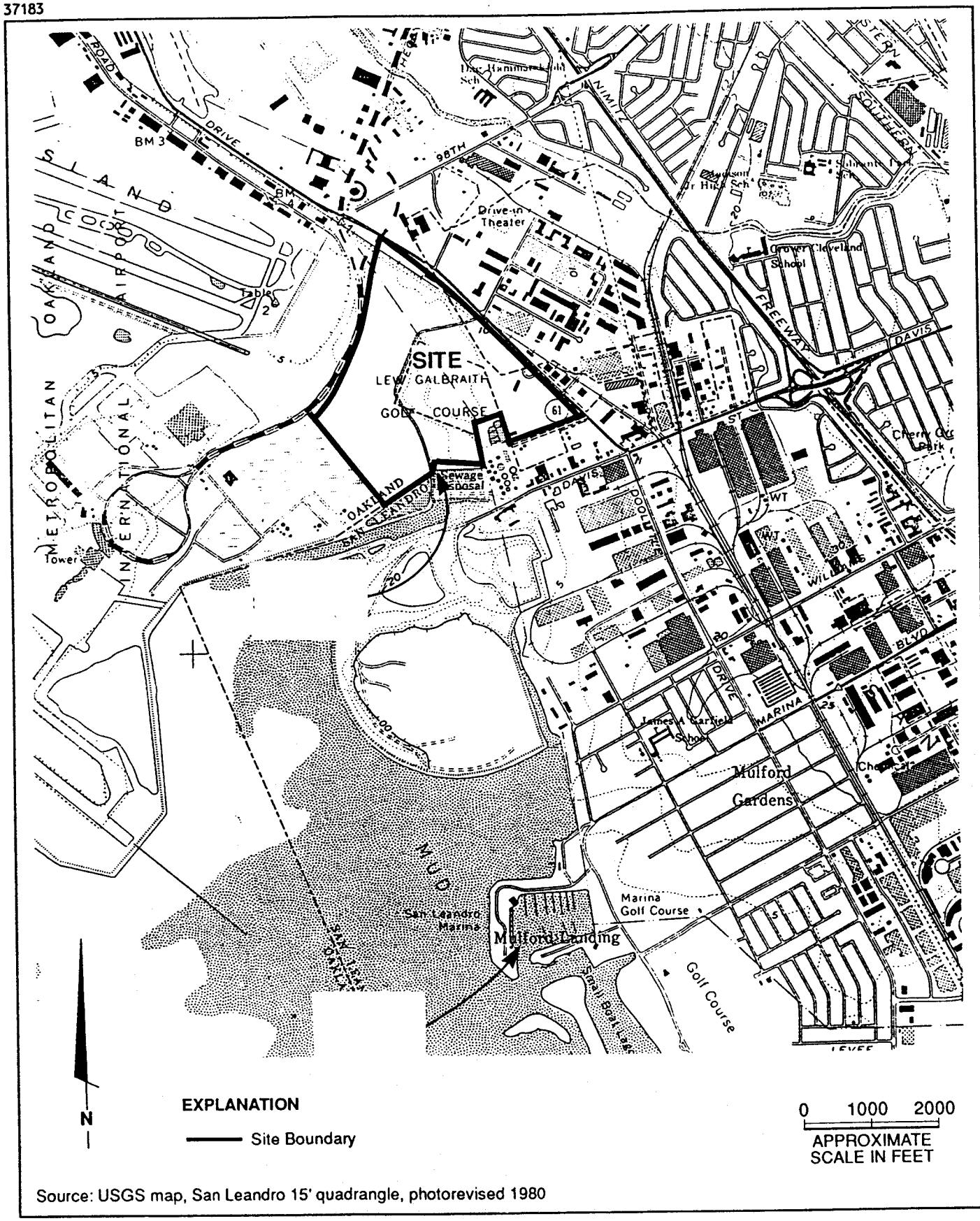
Harding-Lawson Associates, 1994C, Addendum to Report of Waste Discharge, Galbraith Golf Course, Oakland, CA, report dated July 1, 1994.

LSA Associates, 1994 Draft Conceptual Wetland Mitigation and Monitoring Plan, Port of Oakland, Alameda County, report dated July 7, 1994

Subsurface Consultants Inc., 1994A, Geotechnical Investigation - Proposed Galbraith Dredged Disposal Site, Oakland, CA, report dated June 22, 1994.

Subsurface Consultants Inc., 1994B, Response to Review Comments, Geotechnical Investigation - Proposed Galbraith Dredged Disposal Site, Oakland, CA, report dated July 15, 1994.

Woodward-Clyde Consultants, 1993, Interim Groundwater Contamination Report for Central San Leandro, prepared for DTSC, dated January 1993.



Source: USGS map, San Leandro 15' quadrangle, photorevised 1980

Figure 1. Location Map - Galbraith Dredged Sediment Disposal Site, Oakland, Alameda County.

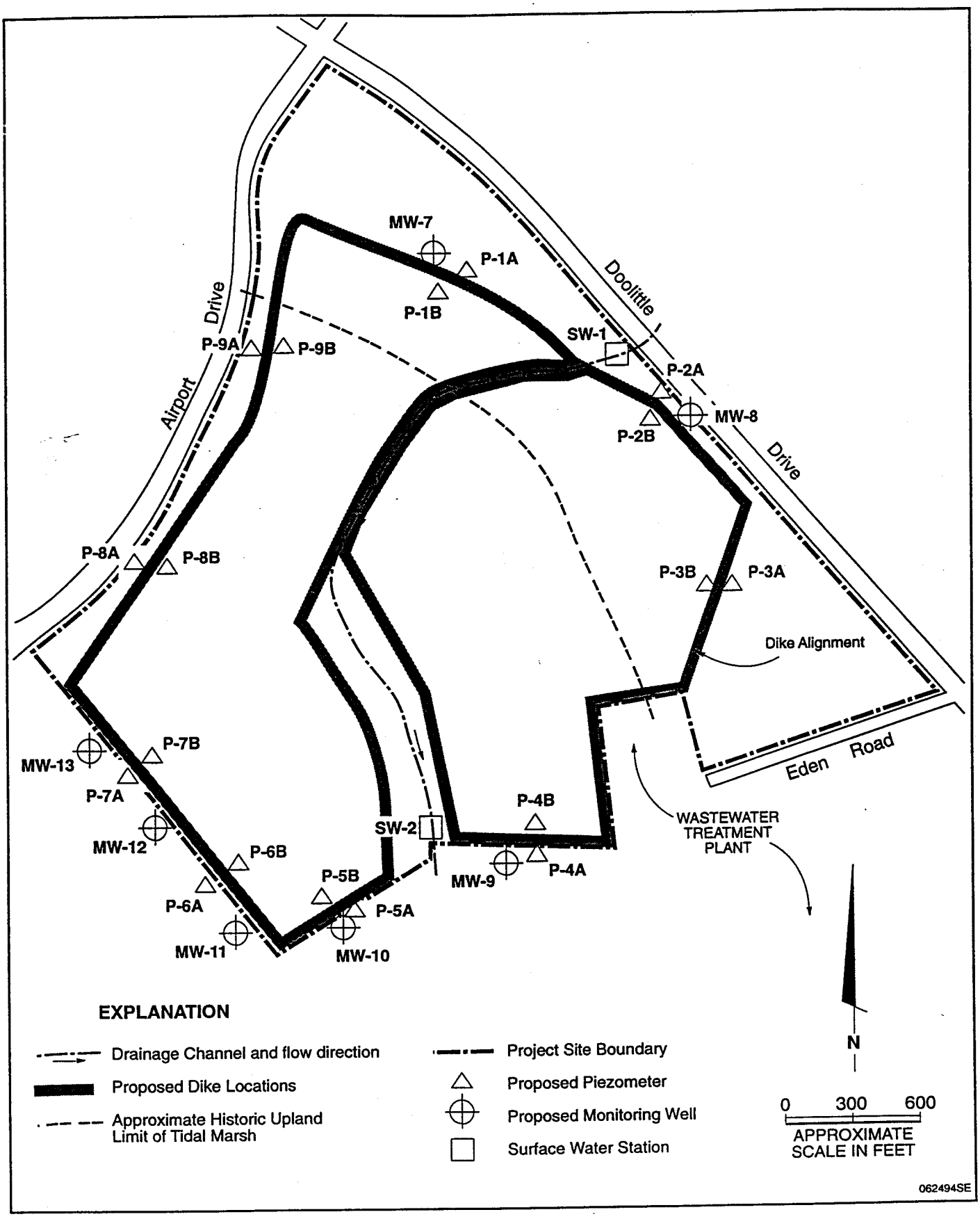


Figure 2. Site Map - Galbraith Dredged Sediment Disposal Site, Oakland, Alameda County (from HLA, 1994 C).

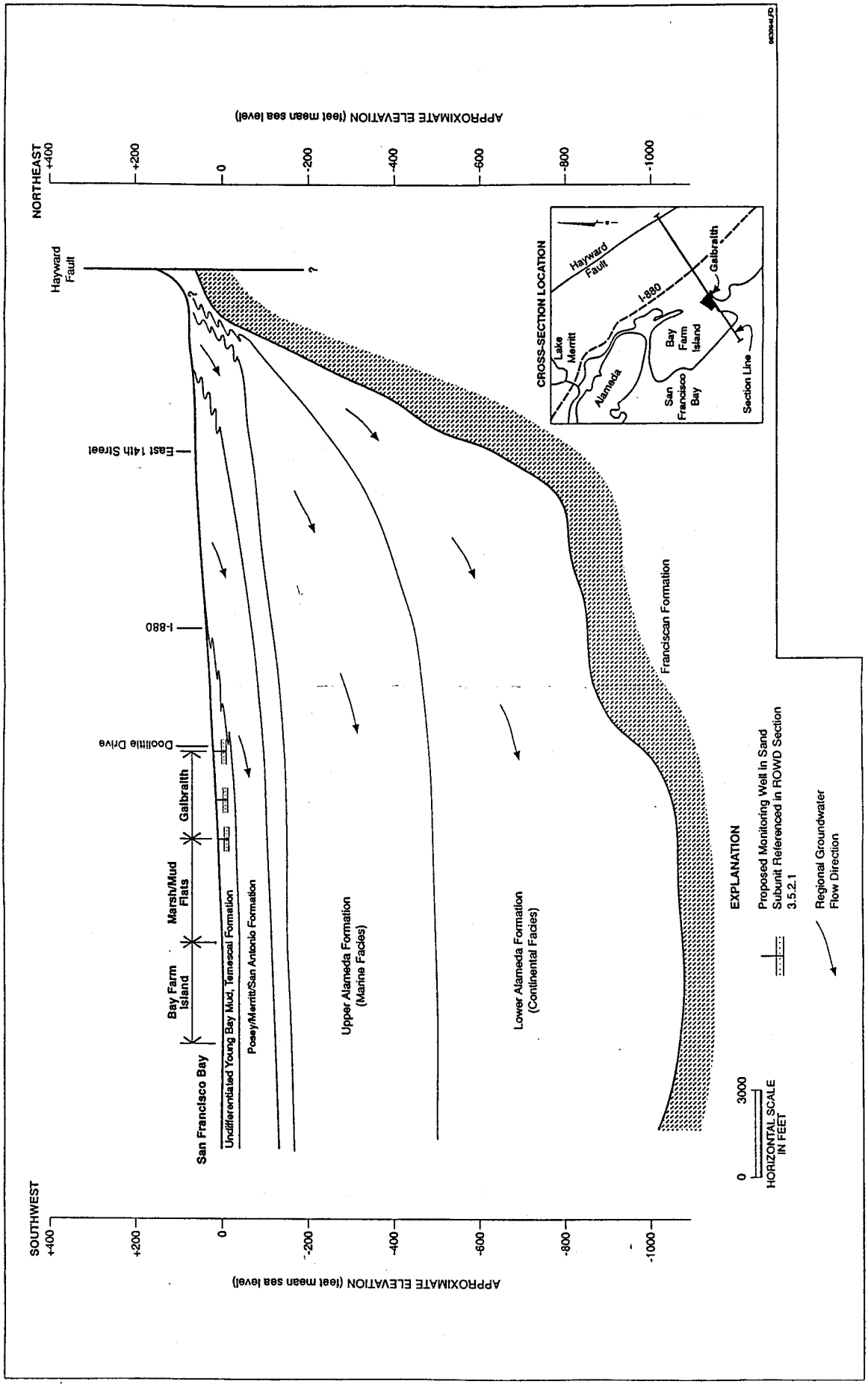
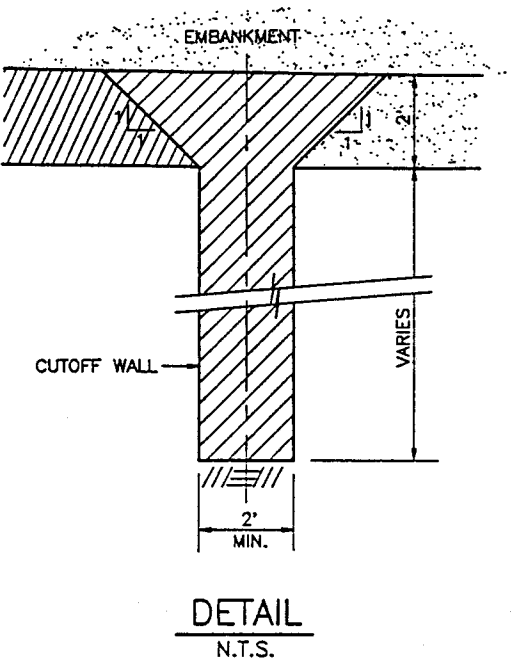
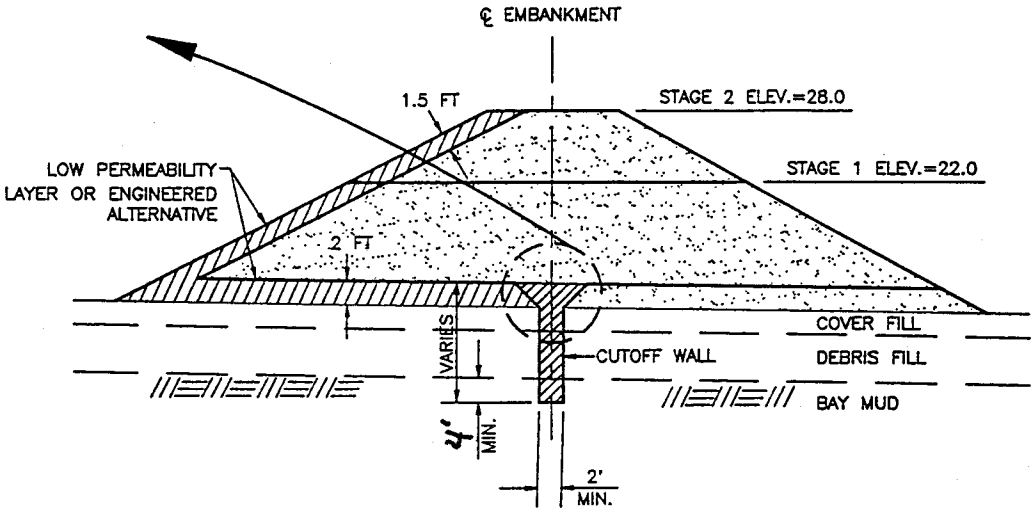


Figure 3. Generalized Regional Geologic Cross Section - Galbraith Dredged Sediment Disposal Site, Oakland, Alameda County (from HLA, 1994 C).



DETAIL
N.T.S.



SCALE: 1"=10'

NOTE: DEPTH OF EMBEDMENT OF CUTOFF WALL INTO BAY MUD WILL BE DETERMINED IN THE FIELD BY THE ENGINEER.

Figure 4. Typical cut off wall and dike design - Galbraith Dredged Sediment Disposal Site, Oakland, Alameda County(from HLA, 1994 C).

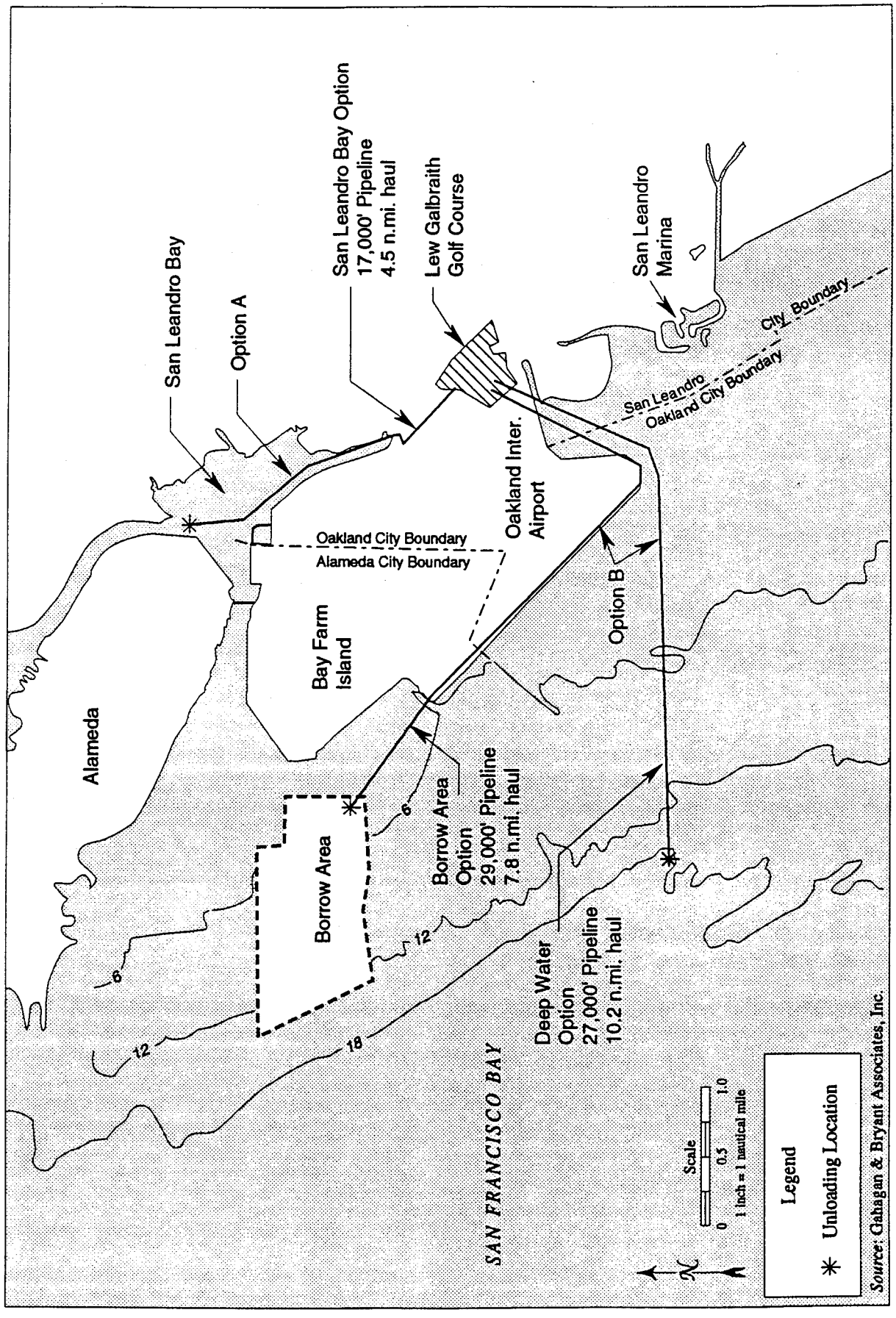


Figure 5. Pump-out and pipeline options for disposal at Galbraith Dredged Sediment Disposal Site, Oakland, Alameda County (from Port of Oakland EIR, 1994).

ATTACHMENT A

Galbraith Dredged Sediment Disposal Site
Sediment Screening Criteria (all units ppb)

Constituent	Criteria	Attenuation Factor	Dilution Factor	Acceptance Limit
Inorganics				
Arsenic	20	300	10	600
Cadmium	10	300	10	300
Chromium VI	11	300	10	330
Copper	20	300	10	600
Lead	5.6	300	10	168
Mercury	1	300	10	30
Nickel	7.1	300	10	213
Zinc	58	300	10	1740
Organics				
PCB's	0.5	150	20	3.75
Tributyltin	0.06	150	20	0.45
PAH's	15	150	20	112.5

Notes: Based on waste extraction test using deionized water as extractant.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

Groundwater, Surfacewater & Geotechnical

SELF-MONITORING PROGRAM

FOR

PORT OF OAKLAND
GALBRAITH DREDGED SEDIMENT DISPOSAL SITE
TEMPORARY
CLASS II SURFACE IMPOUNDMENT

OAKLAND, ALAMEDA COUNTY

ORDER NO. 94-131

CONSISTS OF

PART A

AND

PART B

PART A

A. GENERAL

Reporting responsibilities of waste dischargers are specified in Sections 13225(a), 13267(b), 13383, and 13387(b) of the California Water Code and this Regional Board's Resolution No.73-16. This Self- Monitoring Program is issued in accordance with Provisions 10 and 11 of Regional Board Order No. 94-131.

The principal purposes of a Self-Monitoring Program are: (1) to document compliance with waste discharge requirements and prohibitions established by the Board, (2) to facilitate self-policing by the waste dischargers in the prevention and abatement of pollution arising from waste discharge, (3) to develop or assist in the development of standards of performance, and toxicity standards, (4) to assist the dischargers in complying with the requirements of Article 5, Chapter 15 as revised July 1, 1991.

B. SAMPLING AND ANALYTICAL METHODS

Sample collection, storage, and analyses shall be performed according to the most recent version of EPA Standard Methods and in accordance with an approved sampling and analysis plan.

Water and waste analysis shall be performed by a laboratory approved for these analyses by the State of California. The director of the laboratory whose name appears on the certification shall supervise all analytical work in his/her laboratory and shall sign all reports of such work submitted to the Regional Board.

All monitoring instruments and equipment shall be properly calibrated and maintained to ensure accuracy of measurements.

C. DEFINITION OF TERMS

1. A grab sample is a discrete sample collected at any time.

2. Receiving waters refers to any surface water which actually or potentially receives surface or groundwater which pass over, through, or under waste materials or dredged sediment.

3. Standard observations refer to:

a. Receiving Waters

   1) Floating and suspended materials of waste origin: presence or absence, source, and size of affected area.
   2) Discoloration and turbidity: description of color, source, and size of affected area.
   3) Evidence of odors, presence or absence, characterization, source, and distance of travel from source.

b. Perimeter of the waste management unit.

1) Evidence of liquid leaving or entering the waste management unit, estimated size of affected area and flow rate. (Show affected area on map)
2) Evidence of odors, presence or absence, characterization, source, and distance of travel from source.
3) Evidence of erosion and/or daylighted refuse.

c. The waste management unit.

1) Evidence of ponded water at any point on the waste management facility.
2) Evidence of odors, presence or absence, characterization, source, and distance of travel from source.
3) Evidence of erosion and/or daylighted refuse.
4) Standard Analysis (SA) and measurements are listed on Table A (attached)

D. SAMPLING, ANALYSIS, AND OBSERVATIONS

The dischargers is required to perform sampling, analyses, and observations in the following media:

1. Groundwater per Section 2550.7(b) and
2. Surface water per Section 2550.7(c)

and per the general requirements specified in Section 2550.7(e) of Article 5, Chapter 15.

E. RECORDS TO BE MAINTAINED

Written reports shall be maintained by the dischargers or laboratory, and shall be retained for a minimum of five years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge or when requested by the Board. Such records shall show the following for each sample:

1. Identity of sample and sample station number.

2. Date and time of sampling.

3. Date and time that analyses are started and completed, and name of the personnel performing the analyses.

4. Complete procedure used, including method of preserving the sample, and the identity and volumes of reagents used.

5. Calculation of results.

6. Results of analyses, and detection limits for each analysis.

F. REPORTS TO BE FILED WITH THE BOARD

1. Written detection monitoring reports shall be filed by the 15th day of the month following the report period. In addition an annual report shall be filed as indicated in F.3 below. The reports shall be comprised of the following:

a. Letter of Transmittal

A letter transmitting the essential points in each report should accompany each report. Such a letter shall include a discussion of any requirement violations found during the last report period, and actions taken or planned for correcting the violations. If the dischargers have previously submitted a detailed time schedule for correcting requirement violations, a reference to the correspondence transmitting such schedule will be satisfactory. If no violations have occurred in the last report period this shall be stated in the letter of transmittal. Monitoring reports and the letter transmitting the monitoring reports shall be signed by a principal executive officer at the level of vice president or his duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge originates. The letter shall contain a statement by the official, under penalty of perjury, that to the best of the signer's knowledge the report is true, complete, and correct.

b. Each monitoring report shall include a compliance evaluation summary. The summary shall contain:

1) A graphic description of the velocity and direction of groundwater flow under/around the waste management unit, based upon the past and present water level elevations and pertinent visual observations.

2) The method and time of water level measurement, the type of pump used for purging, pump placement in the well; method of purging, pumping rate, equipment and methods used to monitor field pH, temperature, and conductivity during purging, calibration of the field equipment, results of the pH, temperature conductivity and turbidity testing, well recovery time, and method of disposing of the purge water.

3) Type of pump used, pump placement for sampling, a detailed description of the sampling procedure; number and description of equipment, field and travel blanks; number and description of duplicate samples; type of sample containers and preservatives used, the date and time of sampling, the name and qualifications of the person actually taking the samples, and any other observations.

c. A map or aerial photograph shall accompany each report showing observation and monitoring station locations.

d. Laboratory statements of results of analyses specified in Part B must be included in each report. The director of the laboratory whose name appears

on the laboratory certification shall supervise all analytical work in his/her laboratory and shall sign all reports of such work submitted to the Board.

1) The methods of analyses and detection limits must be appropriate for the expected concentrations. Specific methods of analyses must be identified. If methods other than EPA approved methods or Standard Methods are used, the exact methodology must be submitted for review and approved by the Executive Officer prior to use.

2) In addition to the results of the analyses, laboratory quality assurance/quality control (QA/QC) information must be included in the monitoring report. The laboratory QA/QC information should include the method, equipment and analytical detection limits; the recovery rates; an explanation for any recovery rate that is less than 80%; the results of equipment and method blanks; the results of spiked and surrogate samples; the frequency of quality control analysis; and the name and qualifications of the person(s) performing the analyses.

e. An evaluation of the effectiveness of the leachate monitoring or control facilities, which includes an evaluation of leachate buildup within the disposal units, a summary of leachate volumes removed from the units, and a discussion of the leachate disposal methods utilized.

f. A summary and certification of completion of all standard observations for the waste management unit, the perimeter of the waste management unit, and the receiving waters.

2. CONTINGENCY REPORTING

a. A report shall be made by telephone of any seepage from the disposal area immediately after it is discovered. A written report shall be filed with the Board within five days thereafter. This report shall contain the following information:

1) a map showing the location(s) of discharge;
2) approximate flow rate;
3) nature of effects; i.e. all pertinent observations and analyses; and
4) corrective measures underway or proposed.

b. If any instantaneous maximum effluent limit is exceeded, within 24 hours of receiving the analytical results indicating the violation, a confirmation sample shall be taken and analyzed with 24 hour turn-around time. If the instantaneous maximum is violated in the second sample, the discharger shall notify Regional Board staff immediately. The Executive Officer may order the discharge to be terminated, on a case-by-case basis."

3. REPORTING

By January 31 of each year the dischargers shall submit an annual report to the Board covering the previous calendar year. This report shall contain:

a. A comprehensive discussion of the compliance record, and the corrective actions taken or planned which may be needed to bring the dischargers into full compliance with the waste discharge requirements.

b. A map showing the area, if any, in which filling has been completed during the previous calendar year.

c. A written summary of the groundwater analyses indicating any change in the quality of the groundwater.

d. An evaluation of the effectiveness of the leachate monitoring/ control facilities, which includes an evaluation of leachate buildup within the disposal units, a summary of leachate volumes removed from the units, and a discussion of the leachate disposal methods utilized.

4. WELL LOGS

A boring log and a monitoring well construction log shall be submitted for each sampling well established for this monitoring program, as well as a report of inspection or certification that each well has been constructed in accordance with the construction standards of the Department of Water Resources. These shall be submitted within 30 days after well installation.

PART B

PORT OF OAKLAND
GALBRAITH DREDGE SEDIMENT DISPOSAL SITE
TEMPORARY
CLASS II SURFACE IMPOUNDMENT

I. DESCRIPTION OF MONITORING STATIONS[1]

A. DREDGED SEDIMENT

DS-1 At a point in the pipeline as dredged sediment is being discharged at the Galbraith Site.

B. INFLUENT

SW-3 At a point in the surface water discharge system immediately after discharge from the first weir and prior to discharge into the vegetated control area.

C. EFFLUENT

SW-2 At a point in the surface water discharge system immediately after discharge from the vegetated control area and second weir.

D. RECEIVING WATERS

SW-1 At a point in the drainage channel where it daylights west of Doolittle Drive. This location is upstream of the surface impoundment.

SW-4 At a point in San Francisco Bay at least 100 feet but no more than 200 feet downstream from the discharge point.

E. GROUNDWATER MONITORING STATIONS

MW-7,8,9,10,11,12,13 - Groundwater monitoring wells shall be located as close to the outboard toe of the perimeter dikes as reasonable but no further than 50 feet. The groundwater monitoring wells should monitor the first water-bearing zone encountered.

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[1]All stream samples shall be collected mid-stream and within the upper 12 inches of the stream.

F. GEOTECHNICAL MONITORING SYSTEM

1. PIEZOMETER PAIRS: P-1A,1B,2A,2B,3A,3B,4A,4B, 5A,5B,6A,6B,7A,7B,8A,8B,9A,9B For each pair, one piezometer will be placed inboard and the other outboard of the perimeter cutoff wall to monitor for potential leakage through the cutoff wall.

2. SURVEY POINTS: SP-1 through SP-n
Temporary survey points will be installed at a 200-foot interval along the crest of the dikes to monitor for potential movement.

II. SCHEDULE OF SAMPLING AND ANALYSIS

The schedule of sampling and analysis is provided in the attached Table A.

Samples of effluent and receiving waters shall be collected at times coincident with influent sampling unless otherwise stipulated. The Regional Board or Executive Officer may approve an alternative sampling plan if it is demonstrated that expected operating conditions warrant a deviation from the standard sampling plan.

Reports submitted in compliance with this Self-Monitoring Program shall be submitted on the following on the following bases:

Monthly Reporting - Monthly reports shall be submitted during placement of the dredged sediment and decanting operations. Monthly reports shall be submitted by the 15th day of the month following the reporting period, beginning with the first month that dredged sediment is discharged.

Quarterly Reporting - Quarterly reports shall be submitted during the dredged sediment drying phase of the project. Quarterly reports shall be submitted by the 15th day of the month following the reporting period (i.e., January 15, April 15, July 15, and October 15).

Semiannual Reporting: Semiannual Reports shall be submitted during the closure and redevelopment phases of the Galbraith site. Semiannual reports shall be submitted by the 15th day of the month following the reporting period (i.e., January 15 and July 15).

Annual Reporting: Annual monitoring shall be conducted following redevelopment of the site as a golf course. Annual monitoring shall continue until such time that the discharger demonstrates to the satisfaction of the Executive Officer that monitoring is no longer necessary at the site.

This information shall be submitted to the Board:

Executive Officer
California Regional Water Quality Control Board
2101 Webster Street, Suite 500
Oakland, CA 94612

During all phases of this project, Annual Report shall be submitted by January 15 of each year in place of the monthly, quarterly or semiannual report due on the same day.

IV. MISCELLANEOUS REPORTING

If any chemicals or additives are proposed to be used in the operation and/or maintenance of the groundwater extraction/treatment system, the discharger shall obtain the Executive Officer's concurrence prior to use. The details concerning such approved use shall be reported in the next periodic report submitted to the Board.

I, Steven R. Ritchie, Executive Officer, hereby certify that the foregoing Self-Monitoring Program:

1. Has been developed in accordance with the procedure set forth in this Board's Resolution No. 73-16 in order to obtain data and document compliance with waste discharge requirements established in Regional Board Order No. 94-131.

2. Was adopted by the Board on September 21, 1994.

3. May be reviewed at any time subsequent to the effective date upon written notice from the Executive Officer or request from the discharger, and revisions will be ordered by the Executive Officer or the Board.

Steven R. Ritchie
Executive Officer

Attachments: Table A. Schedule for Sampling, Measurements, and Analysis
Figure 1 - Location Map
Figure 2 - Site Map

TABLE A1
SCHEDULE FOR SAMPLING, MEASUREMENTS, AND ANALYSIS
PORT OF OAKLAND
GALBRAITH DREDGE SEDIMENT DISPOSAL SITE
TEMPORARY
CLASS II SURFACE IMPOUNDMENT

Sampling Station	DS-1	SW-1	SW-2	SW-3	SW-4	MW-n
Type of Sample	G	G	G	G	G	G
Flow Rate	cont.	-	cont	-	-	-
Moisture Content	12hrs	-	-	-	-	-
Bioassay 96-hr % survival	-	-	W/M	-	M	-
Total Dissolved Solids	-	M/Q	M/Q	M/Q	M/Q	M/Q
Total Suspended Solids	-	M/Q	6 hrs	M/Q	W/M	M/Q
Total Petroleum Hydrocarbons as Gasoline, Diesel, and Motor Oil (EPA Method 8015 modified)	-	Q	W/M	Q	M	M/Q
Nitrate (EPA Method 300.0)	-	Q	W/M	Q	Q	M/Q
Turbidity (NTU's) - field	-	-	-			
pH (units) - field	-	M/Q	5/W	M/Q	Q	M/Q
Dissolved Oxygen (mg/l and % saturation)	-	M/Q	W/M	-	M	-
Temperature (°C)	-	M/Q	5/W	M/Q	W/M	M/Q
Chloride	-	Q	W/M	Q	Q	M/Q
Sulfate	See Note	Q	W/M	Q	Q	M/Q
Arsenic , Chromium (hexavalent), Copper, Cadmium, Lead Nickel, Zinc	See Note	M	W	M	M	Q
Cyanide, Mercury Selenium, Silver	See Note	Q	M	Q	Q	2Y
EPA Method 8260	-	Q	W/M	Q	Q	Q
EPA Method 8100	See Note	Q	W/M	Q	Q	Q
EPA Method 608	See Note	Q/2Y	Q/2Y	Q/2Y	Q/2Y	Q/2Y
Standard Observations	-	W	D	D	W	-
Groundwater elevations	-	-	-	-	-	M/Q

LEGEND FOR TABLE A

TYPES OF SAMPLES

G = grab sample
C-24 = 24 hr. composite
Cont. = continuous sampling
DI = depth integrated sample
BS = bottom sediment sample
O = observation
- = none required

TYPES OF STATIONS

I = intake or influent stations
E = effluent sampling stations
D = discharge point sampling stations
C = receiving water sample stations
L = basin and/or pond levee stations
B = bottom sediment station
G = groundwater station

FREQUENCY OF SAMPLING

H = once each hour
D = once each day
W = once each week
M = once each month
6 hrs = once every 6 hours
12 hrs = once every 12 hours
Y = once each year in June

V = varies; total ammonia nitrogen shall be analyzed and un-ionized ammonia calculated whenever fish bioassay test results fail to meet the specified percent survival

2/W = 2 days per week
5/W = 5 days per week
2/M = 2 days per month
2Y = once in March and once in September

Q = quarterly, once in March, June, September, and December

W/M = weekly for first three months after startup of operations and reduced to monthly thereafter

W/Y = weekly for first three months after startup of operations and reduced to annually thereafter

W/Q = weekly for first three months after startup of operations and reduced to quarterly thereafter

M/B = monthly for first 12 months after startup of operations and reduced to every two months thereafter

M/Y = monthly for first 12 months after startup of operations and reduced to annually thereafter

2D = every 2 days
2W = every 2 weeks
3M = every 3 months
Cont = continuous

Q/Y = quarterly for first year after startup of operations and reduced to annually thereafter

M/Q = monthly for first 12 months after startup and reduced to quarterly thereafter

Table 1B Geotechnical Monitoring Program

Type of Monitoring	Piezometers	Survey Points	Visual Observations
Station Number	P-1 to P-n	SP-1 to SP-n	Outboard slope & bank top
Water Levels During Filling	D		
Water Levels During Drying/Decanting	W		
Survey During Filling		W	
Survey During Drying/Decanting		M	
Visual Inspection During Filling			D
Visual Inspection During Drying/Decanting			W

Notes:
- o Surface water sampling is not required during the second and third quarters of each year when there is no discharge from SW-2.
- o The discharger will hold and sample the water in the vegetated ditch prior to discharge during the initial decanting episode and during the decanting of turning basin sediments.
- o DS-1 shall be sample at the following frequency - Turning Basin: one sample every 5,000 cubic yards, Inner Harbor: one sample every 25,000 cubic yards, Outer Harbor: one sample every 50,000 cubic yards.

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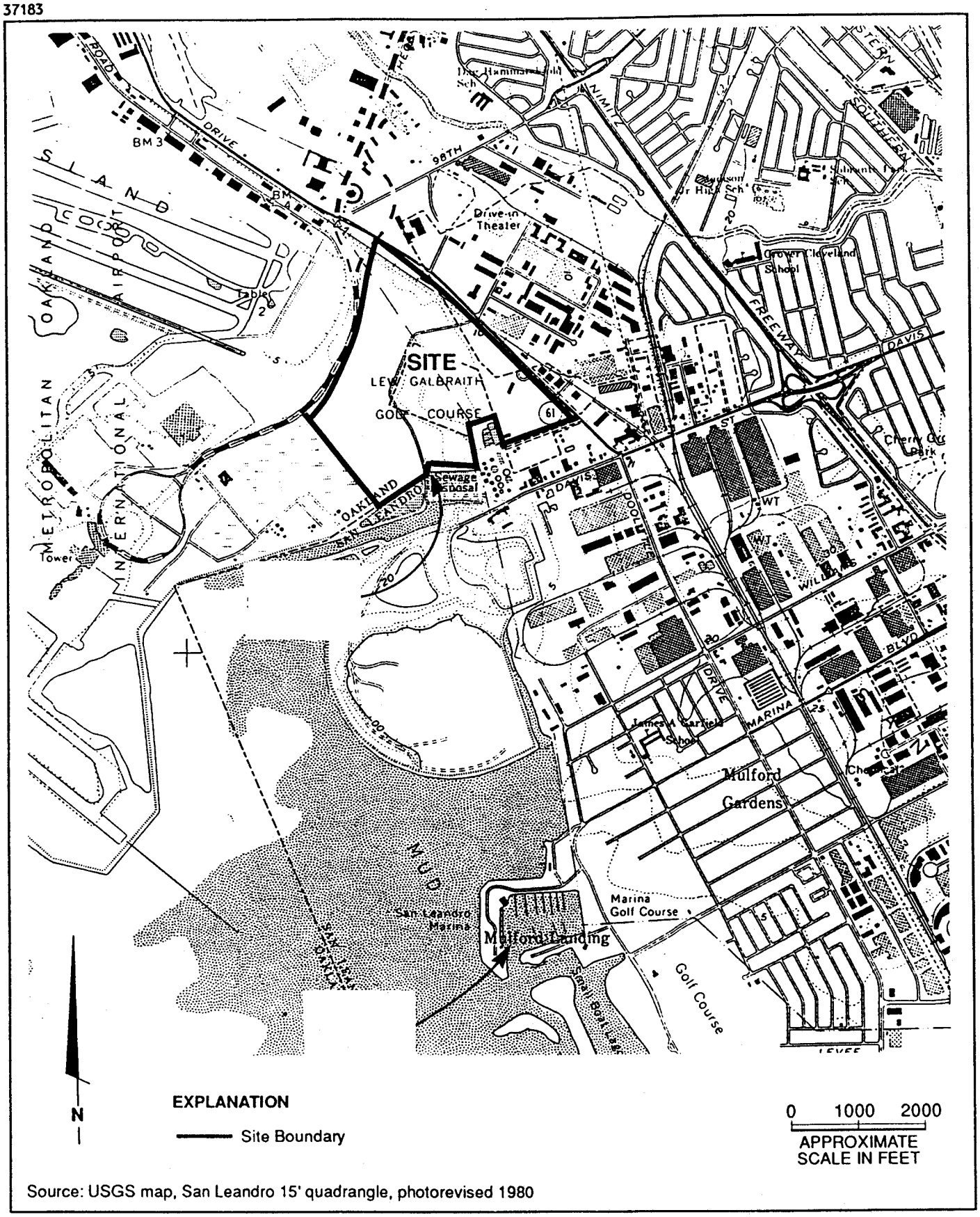

Source: USGS map, San Leandro 15' quadrangle, photorevised 1980

Figure 1. Location Map - Galbraith Dredged Sediment Disposal Site, Oakland, Alameda County.

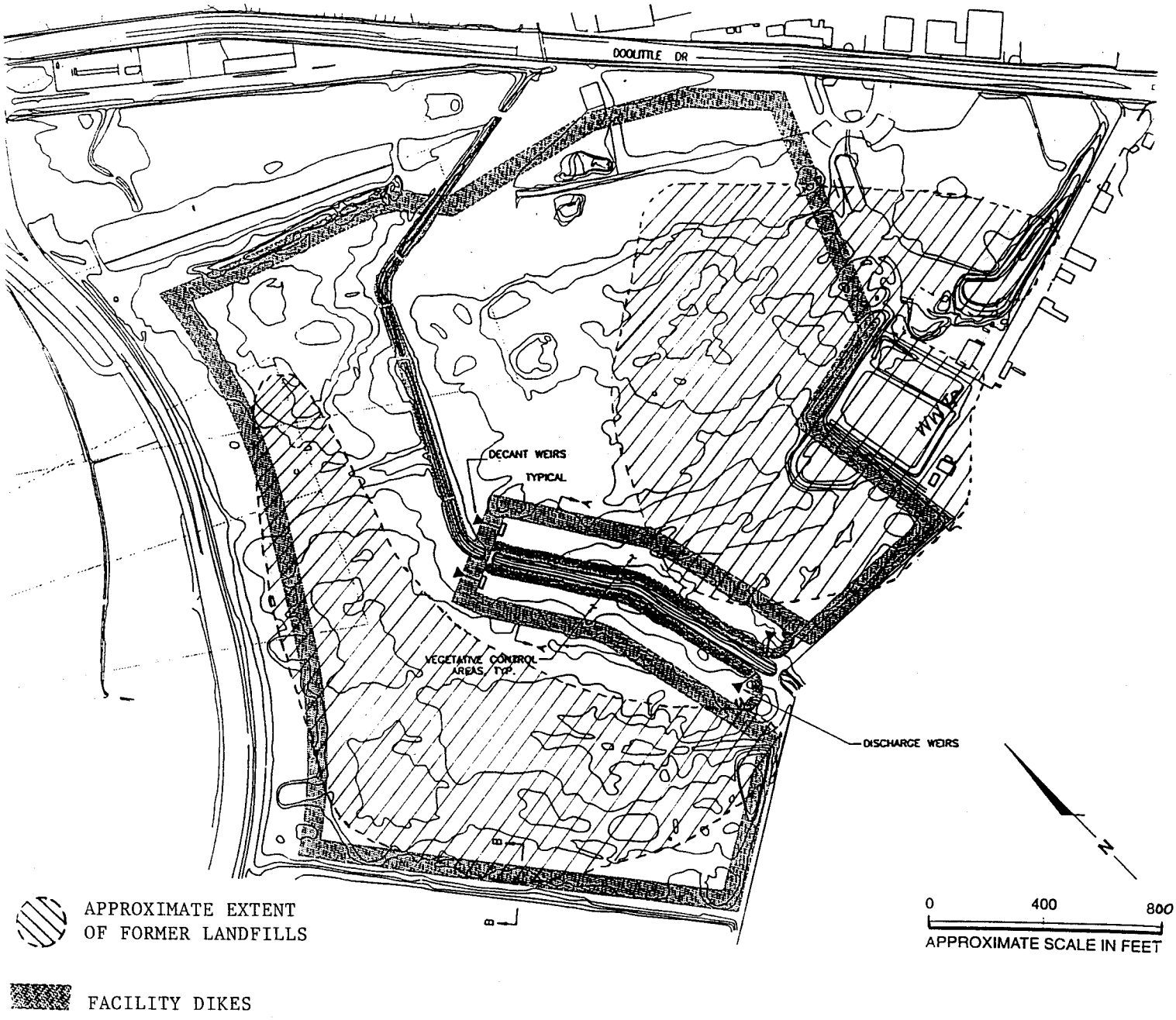

Figure 6. Site Map and Location of Former Landfills - Galbraith Dredged Sediment Disposal Site, Oakland, Alameda County.

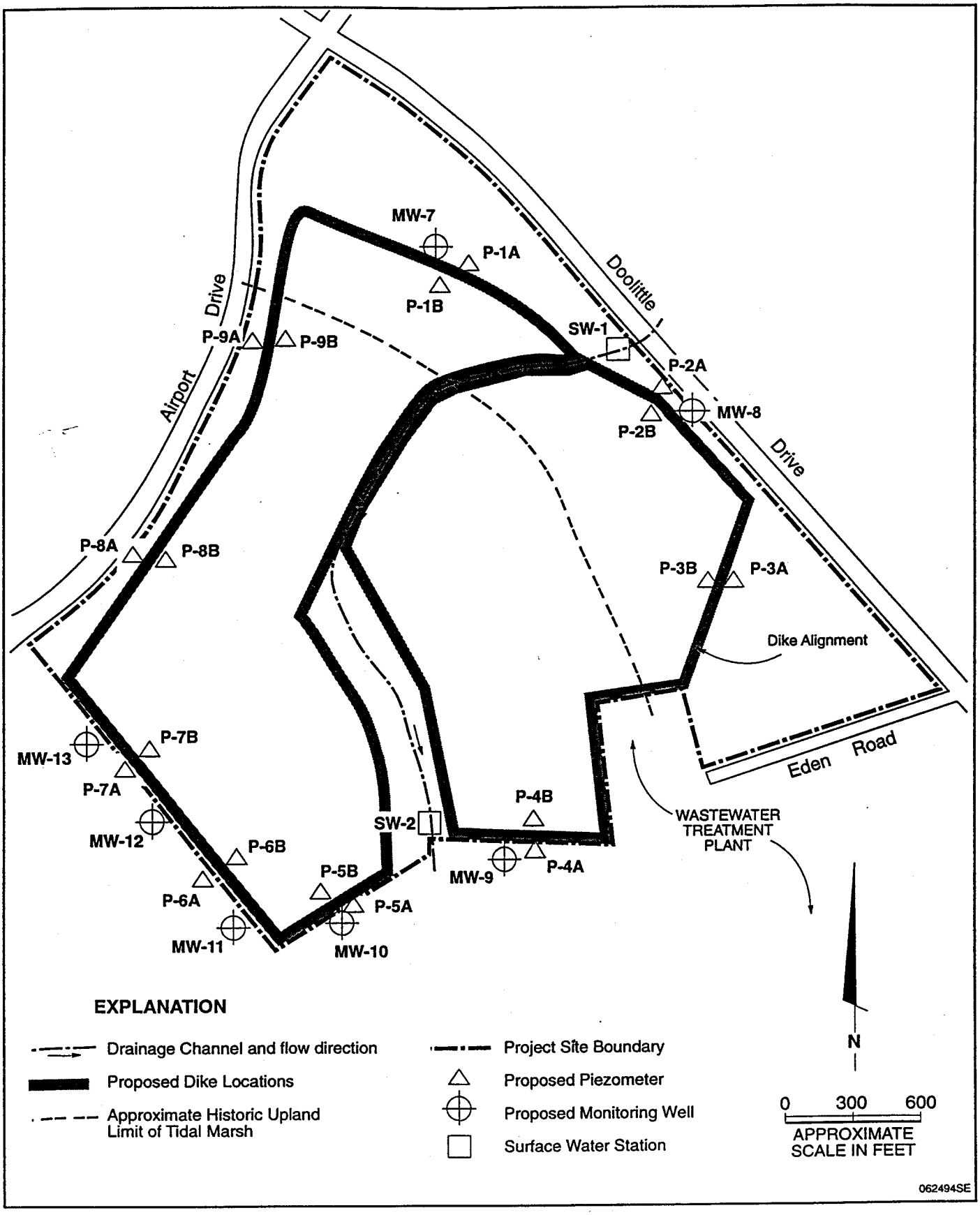

Figure 2. Site Map - Galbraith Dredged Sediment Disposal Site, Oakland, Alameda County (from HLA, 1994 C).